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FORM PTO-1390 (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER: P03547US1

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5): 09/744,324

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/US99/15511	8 July 1999 (8.07.99)	10 July 1998 (10.07.98)

TITLE OF INVENTION: PROCESS FOR PRODUCING FRESH SAUSAGE

APPLICANT(S) FOR DO/EO/US: KOBUSSEN ET AL.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [ ] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] has been transmitted by the International Bureau.
   c. [X] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [ ] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [X] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [X] have been transmitted by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [X] Other items or information: -Certificate of Express Mailing (in duplicate) Label No. EL688892730US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: **TOWNSEND ENGINEERING CO.**
APPLN. NO. **PCT/US99/1511**
FILED: July 9, 1999
TITLE: PROCESS FOR PRODUCING FRESH SAUSAGE
INVENTORS: KOBUSSEN, ET AL.
U.S. SERIAL NO.60/092,375

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the International Preliminary Examination Report dated October 31, 2000, please amend the above-entitled application as follows:

IN THE SPECIFICATION

Page 4, lines 22-24, delete "First of all it may be incorporated into the collagen gel at the gel manufacturing level. However, this method has several drawbacks." and

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CERTIFICATE OF MAILING (37 C.F.R. § 1.8(a))

I hereby certify that this document and the documents referred to as enclosed therein are being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231, on this 9 day of JANUARY, 2001.

Kirk M. Hartung

Kirk M. Hartung

substitute therefore --While the lubricant may be incorporated into the collagen gel at the gel manufacturing level, such as described in publication WO-A-93/12660, this method has several drawbacks."

IN THE CLAIMS

Attached is a new set of renumbered claims 1-14.

REMARKS

Applicant appreciates the acknowledgement in the Preliminary Examination Report of the novelty and inventiveness of claims 1-8 and 10-15. Applicant has amended the defects in the applications cited in items VII and VIII of the report. In particular, Applicant has cited reference D-1 (WO-A-93/12660) on page 4 of the Specification, as required in item VII(1). Applicant has amended page 4 of the Specification to eliminate any lack of clarity regarding the application of the lubricant to the gel at the time of manufacture, as required by item VIII(1).

Applicant has also renumbered the claims as claims 1-14 as required in item VII(2), and has corrected the antecedent support problem in claim 12, as required in item VIII(2).

Accordingly, the application is believed to be in form for allowance.

Respectfully submitted,

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Title of Invention: PROCESS FOR PRODUCING FRESH SAUSAGE

BACKGROUND OF THE INVENTION

The present invention relates to the preparation of collagen-coated foodstuffs, especially fresh sausages.

There are two approaches to making sausages. The first is to take natural or artificial sausage casing and stuff it with sausage meat. In recent times, it has become known to co-extrude a strand of sausage material which has an inner core of meat emulsion having an outer surface material that can be coagulated to provide an encasement for the strand. The outer surface material may consist of a gel with a collagen protein.

Recent developments on coextrusion technology have made it possible to make market acceptable fresh sausages, by intensifying the coagulation process prior to linking the coextruded sausage strand. Coagulation refers to the step of hardening the casing. This is principally achieved in two ways; first by removal of water from the collagen gel coating on the sausage; and secondly by crosslinking the collagen fibers in the gel to form a stable network. Crosslinking is often facilitated by adding crosslinking agents to the gel such as liquid smokes.

However these methods haven't sufficiently dealt with the bursting or splitting of the casing during cooking of the sausages. Similar to prefabricated collagen casings, coextended casings have the tendency to split during cooking. This is especially a problem when a meat formulation is used where the meat does not adhere to the casing. Generally speaking this is the case for meat formulations which have a low lean meat content versus fat, water and other ingredients. For example most British breakfast sausages, characterized by

the ingredient of rusk or stale bread crumbs, generally have a low casing to meat adherence.

When during cooking the heat is applied to the sausage evenly and slowly, tendency to burst is low. Methods as grilling, the most popular method of cooking for British breakfast sausages, give high level of split sausages because heat generally is intensively applied to the sausage only from one direction. Low level of splits of fresh sausages, especially for the British breakfast sausage market, is a quality mark.

It is therefore a principle object of the present invention to provide a method for manufacturing fresh sausages with an edible casing in which the previous problems and disadvantages of the known methods do not occur.

It is a further object of the present invention to provide a novel method for reducing unwanted casing splits during cooking of fresh co-extruded sausage product.

It is still a further object of the present invention to provide a novel method for reducing unwanted casing splits during cooking of fresh British breakfast sausages.

It is still a further object of the present invention to provide a novel method of applying a liquid to the casing of fresh sausages, to prevent splitting of the casing during cooking.

An additional object of the present invention is to create by co-extrusion a substantially uniform layer of a collagen containing gel around an elongated strand of foodstuff, and treating the casing with a liquid to prevent the dehydration of the casing during cooking.

These and other objects will become clear from the following description of the present invention.

SUMMARY OF THE INVENTION

Co-extruding a strand of edible material to create a substantially uniform layer of an edible casing forming material around an inner strand of food material; coagulating said casing forming material to form a casing around said strand of food material; linking said strand into individual portions; and treating said casing forming material with a flowable anti-dehydration agent ("ada") before or after said linking.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides a process for coagulating co-extruded collagen containing gel surrounding fresh edible food stuffs, i.e. sausages. Co-extrusion methods are mainly being used for co-extrusion of sausage or sausage like materials. While the instant process relates particularly to the manufacturing of sausages, it may also be used in the production of other collagen coated foodstuffs, such as fish or meat products containing vegetable or cheese or both. The term "sausage" as used herein refers to any type of emulsified food product that is formed into fresh sausage links or the like.

The invention is neither limited to collagen coated foodstuffs, but may also be applied for co-extruding foodstuffs with a different kind of coating material such as casein, soy, wheat, cellulose, alginate, chitosan or starch based gels.

The invention is particularly useful when intensified coagulation methods are used for coextruded fresh sausage, which result is a strong casing surrounding the fresh product, with characteristics such as bite, mouthfeel and cooking behavior much similar to regular prefabricated collagen casings.

These fresh sausage types have the tendency to show casing splits during cooking, especially during grilling. British breakfast sausage characterized by the ingredient of rusk or stale bread crumbs, especially have

the tendency to split because of the generally low adherence of the casing to the meat.

Existing coagulation methods involve the use of prolonged brine treatment of more than 10 seconds and the used of a highly soluble salts with disassociation of more than 0.8 moles per liter of water at 20 degrees Celsius. These brine treatments are preferably used in combination with a collagen containing gel having a dry matter content of between 3 and 25%, and/or in combination with an coextruding device of the disk type, and/or a collagen gel having an inorganic acid therein, and/or a linking method whereby stretch is applied on the coextruded sausage rope as it is fed into the linking device. Infra red or ultra violet radiation treatment of the sausage rope as part of the coagulation process is also advantageously applied.

Extensive trials on British breakfast sausages show that when a lubricant is applied to the casing to prevent dehydration of the casing during cooking the splitting is reduced dramatically. Sudden dehydration of the collagen structure in the casing through heat build up, especially when the heat is not applied to the casing evenly (such as when grilled), leads to splitting of the casing. A well chosen and applied lubricant can elevate this problem.

Suitable lubricants are preferably selected from the group of edible fats, edible oils and edible polyhydric alcohols. The lubricant may be applied to the collagen structure of the casing is several manners. First of all it may be incorporated into the collagen gel at the gel manufacturing level. However this method has several drawbacks. Lubricants can influence the stability of the collagen gel, giving shorten shelf lives of the gel. Also the level of lubricants especially when applied in combination with other functional additives such as crosslinking agents, colorants and flavorings , cannot be adjusted to the specific requirements of the sausage product, to achieve a optimum result. It is therefor preferred to apply the lubricant just prior to or after co-extrusion of the collagen gel. Prior to coextrusion the best method to

apply the lubricant we've found is by injecting the lubricant into the gel-flow that leads to the coextruder. Often advantageously inline mixing is applied to achieve a homogeneous distribution of the lubricant through the gel.

The lubricant may also be applied just after the point of extrusion by it being present in the brine bath. A separate bath or shower after the brine bath may also be employed.

A first requirement of the lubricant is that it must sufficiently adhere to the collagen structure of the casing. Especially when applied in the gel before extrusion. The lubricant must be able to mix with the watery collagen gel. Generally therefore oils and fats are only applicable after coextrusion and coagulation in the brine bath, as a dip or spray. Water soluble or dispensable lubricants, though applicable in the gel prior to extrusion, must not be lost in excess amount during the brine treatment. Until 60% of the water in the casing is removed through osmosis during the brine treatment, a lubricant therefore must have good adherence to the collagen fibers in the casing to prevent excess loss into the brine bath. Glycerin is an effective lubricant to be applied through injection just prior to coextrusion. Especially when the glycerin is injected simultaneously with the crosslinking agent such as a liquid smoke, one can create a mixture which gives the right level of strength and lubrication to the casing which are required.

More specifically, the salient features of this invention include the following:

The casing forming material is treated with a flowable anti-dehydration agent ("ada") before or after the linking steps.

The ada is selected from the group of edible oils, edible fats, and/or polyhydric alcohols.

The burning point of the edible oils, edible fats and/or polyhydric alcohols is above 70 degrees Celsius.

The ada contains glycerin.

The casing forming material contains collagen.

The casing forming material has a dry matter of 3-25% by weight.

The casing forming material involving the use of a cross-linking agent set in contact with the casing forming material.

The ada is incorporated into the casing forming material prior to co-extrusion.

The ada is co-extruded simultaneously with the casing forming material around an inner strand of food material.

The ada forms a layer between the inner strand of food material and the outer layer casing forming material.

The ada material being incorporated in a salt containing solution.

The ada is applied by passing the strand of sausage through a bath containing the ada.

The ada is applied by showering the strand of sausage with the ada fluid.

The excess ada fluid is removed from the sausage surface after the sausage surface has been created.

It is therefore seen that this invention will achieve at least all of its stated objectives.

We claim:

1. A process for producing a fresh sausage product, comprising, co-extruding a strand of edible material to create a substantially uniform layer of an edible casing forming material around an inner strand of food material; coagulating said casing forming material to form a casing around said strand of food material; linking said strand into individual portions; and lubricating said casing forming material with a flowable anti-dehydration agent ("ada") just prior to, during or after said coextrusion.

2. A process according to claim 1 characterized by said food material containing fresh meat.

3. A process according to claim 1 characterized by said fresh sausage being a United Kingdom sausage.

4. A process according to claim 3 characterized by said United Kingdom breakfast sausage containing RUSK.

5. A process according to claim 1 characterized by said ada being selected from the group of edible oils, edible fats, and/or polyhydric alcohols.

6. A process according to claim 5 characterized by the burning point of said edible oils, edible fats and/or polyhydric alcohols being above 70 degrees Celsius.

7. A process according to claim 1 characterized by said casing forming material having a dry matter of 3-25% by weight.

8. A process according to claim 1 characterized by the coagulation of said casing forming material involving the use of a cross linking agent set in contact with said casing forming material.

9. A process according to claim 1 characterized by the ada is co-extruded simultaneously with the casing forming material around an inner strand of food material.

10. A process according to claim 10 characterized by said ada forming a layer between the inner strand of food material and the outer layer of casing forming material.

11. A process according to claim 10 characterized by the ada being incorporated in a salt containing solution.

12. A process according to claim 1 characterized by the ada is applied by passing the strand of sausage through a bath containing said ada.

13. A process according to claim 1 characterized by the ada being applied by showering the strand of sausage with the ada fluid.

14. A process according to claim 1 characterized by that excess ada fluid removed from the sausage surface.

Combined Declaration for Patent Application and Power of Attorney
(Includes Reference to PCT International Applications)

Attorney's Docket Number
P03547US1

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PROCESS FOR PRODUCING FRESH SAUSAGE

the specification of which (check only one item below)

is attached hereto.

☒ was filed as United States application

Serial No. 09/743,457

on JANUARY 9, 2001

and was amended

on _____ (if applicable).

☒ was filed as PCT international application

Number PCT/US99/15511

on July 8, 1999

and was amended under PCT Article 19

on February 8, 2000 (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT indicate PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
			YES NO

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112. I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (*Check one*)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S				
PCT APPLICATION NO	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED *(if any)*		

Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)	Attorney's Docket Number P03547US1

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (*List name and registration number*) Donald H. Zarley, Reg. #18,543; Bruce W. McKee, Reg. #19,651; Dennis L. Thomte, Reg #22,497; Michael G. Voorhees, Reg. #25,715; Edmund J. Sease, Reg. #24,741; Mark D. Hansing, Reg. #30,643, Kirk M. Hartung, Reg. #31,021, Daniel J. Cosgrove, Reg. #36,770; Michael R. Crabb, Reg. #37,298, Heidi Sease Nebel, Reg.#37,719; Wendy K. Marsh, Reg.# 39,705; Jeffrey D. Harty, Registration No. 40,639; James A. Napier, Registration No. 42,025; Mark Ziegelbein, Registration No. 43,307; Timothy J. Zarley, Registration No. P-45,253; and Patty L. Ades, Registration No. P-44,496

Send correspondence to: DONALD H. ZARLEY ZARLEY, MCKEE, THOMTE, VOORHEES & SEASE 801 Grand Avenue, Suite 3200 Des Moines, Iowa 50309-2721	**Direct Telephone Calls to:** *(Name and telephone number)* DONALD H. ZARLEY 515-288-3667

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2	FULL NAME OF INVENTOR	FAMILY NAME KOBUSSEN	FIRST GIVEN NAME Jaap	SECOND GIVEN NAME
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)	Attorney's Docket Number P03547US1

SIGNATURE OF INVENTOR 201 Jos Kobussen	SIGNATURE OF INVENTOR 202 Jaap Kobussen
DATE 03/09/00	DATE 03-05-2001
SIGNATURE OF INVENTOR 203 Mart Kobussen	SIGNATURE OF INVENTOR 204 Jacques J. Riemens
DATE 3-2-2001	DATE 03.05.2001

End of Combined Declaration for Patent Application and Power of Attorney